

# EFFECTS OF LARGE-SCALE LAND TRANSACTIONS IN ETHIOPIA

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This NSF funded project is being carried out in collaboration between Jane Southworth, her post doc (Reza Khatami), and graduate students (Carly Muir, Audrey Smith) in the University of Florida Department of Geography, along with Arun Agrawal (University of Michigan), Alemayehu Ayana (Ethiopia Environment and Forest Research Institute), and Dan Brown (University of Washington). The overarching goal of our project is to examine changes in complex human and natural interactions associated with large-scale land transactions, and assess effects of land transactions on agriculture, ecosystem services, and food and energy security. Land transactions represent change in inherently complex and coupled agricultural and natural ecosystems, particularly so in poor countries where land is the principal basis of livelihoods and the provision of substantial ecosystem services, both of which are simultaneously impacted by transactions.

Focusing on Ethiopia, which has registered among the largest number and area for recent land transactions, the project takes advantage of the remarkable opportunity provided by recent large scale transactions to quantify their nature and extent, assess their socioeconomic, land cover/change, and ecological impacts, and model the causal sequences and feedback loops they initiate so as to advance the conceptual understanding of how tenure and institutional changes on land drive human-nature interactions and impacts. The motivation for this project stems from the scale and pace of such transactions, the far-reaching nature of their impacts, the dearth of careful, quantitative analyses of land transactions outcomes, and the substantial contributions to theory and implications for policy that a systematic analysis of their impacts holds.

In the absence of reliable data and rigorous analyses, land transactions generate diametrically divergent viewpoints.



Studies condemn or support transactions depending on whether researchers determine them to be positive for agricultural output and incomes, or negative for equity, food and energy security, distribution of benefits, and ecosystem services. The ground-truthed, quantitative evidence obtained from this work will advance theoretical knowledge frontiers and rigorously analyze the impact of land transactions.

In the summers of 2017 and 2018 the team went into the field to visit the study sites, which can be described as large intensified agricultural systems. This past year, the collection of social and ecological surveys commenced with the aid of locals and trained professionals. While the team at Michigan focuses on the social aspects of this project, the UF team is concentrating on remote sensing techniques that can be used to identify where these land transactions are occurring across Ethiopia. The UF team recently published in the *Journal of Remote Sensing*

*and the Environment*. The manuscript, titled “Operational large-area land-cover mapping: an Ethiopia case Study” and led by Reza Khatami, provides a land cover classification for the entire country at a 30-meter resolution. The next step for Dr. Southworth’s team will be to recreate this process for the years prior to land transactions to determine how much land has transitioned from a natural state to the intensified agriculture. The team is organizing a special paper session for this year’s Association of American Geographer’s annual conference, where we will present our own work and hear from others conducting similar research. Additionally, several team members will be traveling to Bern, Switzerland this April to present results of their work at the Global Land Programme Open Science Meeting.

*Carly Muir is a PhD student in the Department of Geography.*